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63-2-4

COLUMBIA R.

DEPARTMENT of OCEANOGRAPHY

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TILLAMOOK BAY

SCHOOL of SCIENCE

OREGON STATE UNIVERSITY

SILETZ R.

YACUINA R.

ALSEA R.



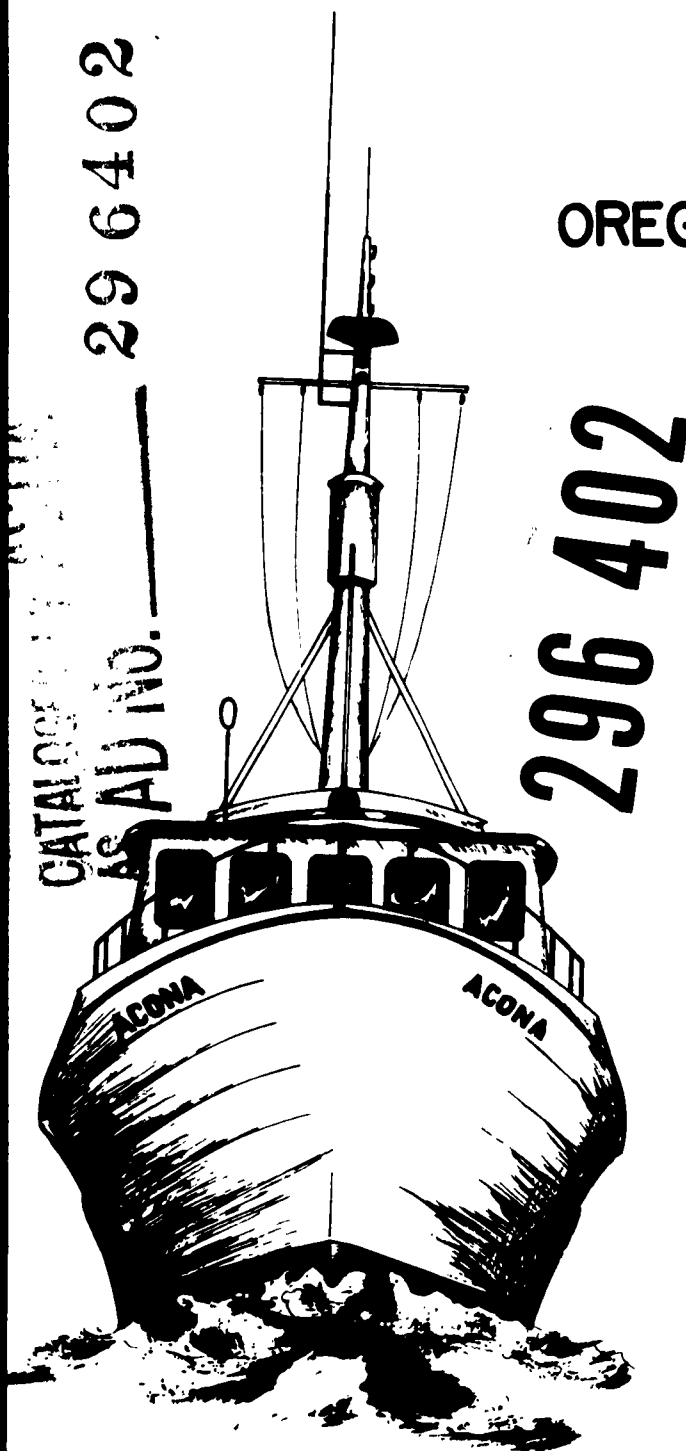
SIUSLAW R.

UNPOUA R.

COOS BAY

COQUILLE R.

ROGUE R.



Surface Temperature and Salinity Observations at Shore Stations On the Oregon Coast for 1961

by
Malcolm Oliphant, Bruce Wyatt
and
Norman F. Kujala

Office of Naval Research
Contract Nonr 1286(02)
Project NR 083-102

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Data Report No. 8 Reference 62-11

September 1962

DEPARTMENT OF OCEANOGRAPHY

SCHOOL OF SCIENCE

OREGON STATE UNIVERSITY

Corvallis, Oregon

SURFACE TEMPERATURE AND SALINITY
OBSERVATIONS AT SHORE STATIONS
ON THE OREGON COAST FOR 1961

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Wayne V. Burt
Chairman

INTRODUCTION

During 1961, a program of shore station sampling of ocean temperatures and salinities was carried out by the Oceanography Department of Oregon State University. This is a continuation of the work reported by Kujala and Wyatt (1961). Sampling was conducted at 11 locations along the Oregon coast and at one location in northern California. Temperature and salinity samples were taken by interested persons living along the coast. Without the participation of these individuals this program could not be successfully carried out. Table I lists the sampling stations by name, the location where the collection was made, and the observers. Figure 1 shows the location of each station.

METHODS AND PROCEDURES

Wherever possible, sampling sites were selected at points where the influence of fresh water runoff was a minimum. Observations were made as close as possible to the time of high tide. Temperatures were read to 0.1°C using a calibrated thermometer contained in a brass bucket with a plastic liner. Water for salinity analysis was stored in pressure-stoppered citrate bottles; titration was completed three to four months after the samples were collected. The method used was that described by Strickland and Parsons (1960) (estimated accuracy $\pm 0.04\%$). Salinities at Seaside Aquarium and Crescent City were computed from salinity hydrometer reading, using tables from Zerbe and Taylor (1953).

RESULTS

Table II lists each temperature and salinity observation taken during 1961. Table III presents summaries of these data in the form of monthly means, maxima, minima, range, and number of observations. Monthly mean values of temperature and salinity at four stations are plotted in Figure 2. Seasonal temperature ranges along the coast for the latitude were small, particularly off central and southern Oregon (Otter Rock and Humbug Mountain). This is attributed, at least in part, to summer upwelling.

Salinity ranges were large and the variations show dependence both on runoff and on upwelling. To the north (Seaside Aquarium and Arch Cape), salinity minima occurred from April to June, showing the effects of local precipitation and of the Columbia river runoff, which was a maximum in June. In central and southern Oregon, the local runoff led to the development of a sharp surface salinity minimum in February. Upwelling in the southern region maintained the salinity at high levels from June to November.

The means for the Columbia River Lightship are plotted in Figure 3. The striking feature here is the exceptionally large salinity range, from an ocean-like high of 32‰ in January to only 17‰ in June, when the Columbia outflow was a maximum.

REFERENCES

- Kujala, Norman and Bruce Wyatt, 1961. Surface Temperatures and Salinity Observations at Shore Stations on the Oregon Coast, Data Report No. 6. Department of Oceanography, Oregon State University, Ref. 61-4.
- Strickland and Parsons, 1960. A Manual of Seawater Analysis. Fish. Res. Bd. Canada Bul. No. 125, pp. 11-17.
- Zerbe, W. B. and C. B. Taylor, 1953. Sea Water Temperature and Density Reduction Tables, U. S. Dept. Comm., Coast and Geod. Surv. Spec. Pub. No. 298, 21 pp. 1953.

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TABLE I. LIST OF SHORE STATIONS

<u>Station Name</u>	<u>Location of Collection</u>	<u>Observer</u>
Columbia River Lightship 46°11.2'N 124°11.0'W	Five miles southwest of the Columbia River south jetty	U. S. Coast Guard
Seaside Aquarium 45°59.7'N 123°55.6'W	At pump outlet into aquarium settling tank which is filled during the highest tide each day from a surf inlet pipe	Mr. Lawrence Smith
Arch Cape 45°48.0'N 123°58.0'W	In the surf on a sand beach	Mrs. Berkeley Snow Mr. John Markham
Netarts 45°26.1'N 123°58.0'W	Boat ramp at the entrance of Netarts Bay.	Mrs. Virginia Cornette
Otter Rock 44°44.6'N 124°58.0'W	Off the rocks	Mr. Robert Troxel
Yachats 44°18.5'N 124° 4.0'W	Off the rocks	Mr. Eugene Hanson
Heceta Beach 44° 3.0'N 124° 7.5'W	Sand beach 1-3/4 miles north of the Suislaw River	Mr. C. H. Grow Mr. H. Dale Harp
Hauser 43°28.0'N 124°17.0'W	Sand beach 12 miles north of Coos Bay	Mr. Leroy Hanson
Bandon 43° 7.0'N 124°25.5'W	Off the rocks at Bandon Wayside	Miss Lura Morgan Mr. George Anthony
Humbog Mountain 42°36.6'N 124°24.0'W	Off the rocks 4 miles south of Humbog Mountain	Mr. E. V. Nelson
Brookings 42° 4.1'N 124°18.8'W	Off the rocks at Harris Beach State Park	Mr. Morton W. Phillips
Crescent City, California 41°44.6'N 124°11.7'W	Off the end of the Crescent City municipal wharf	Mr. Darold Richcreek

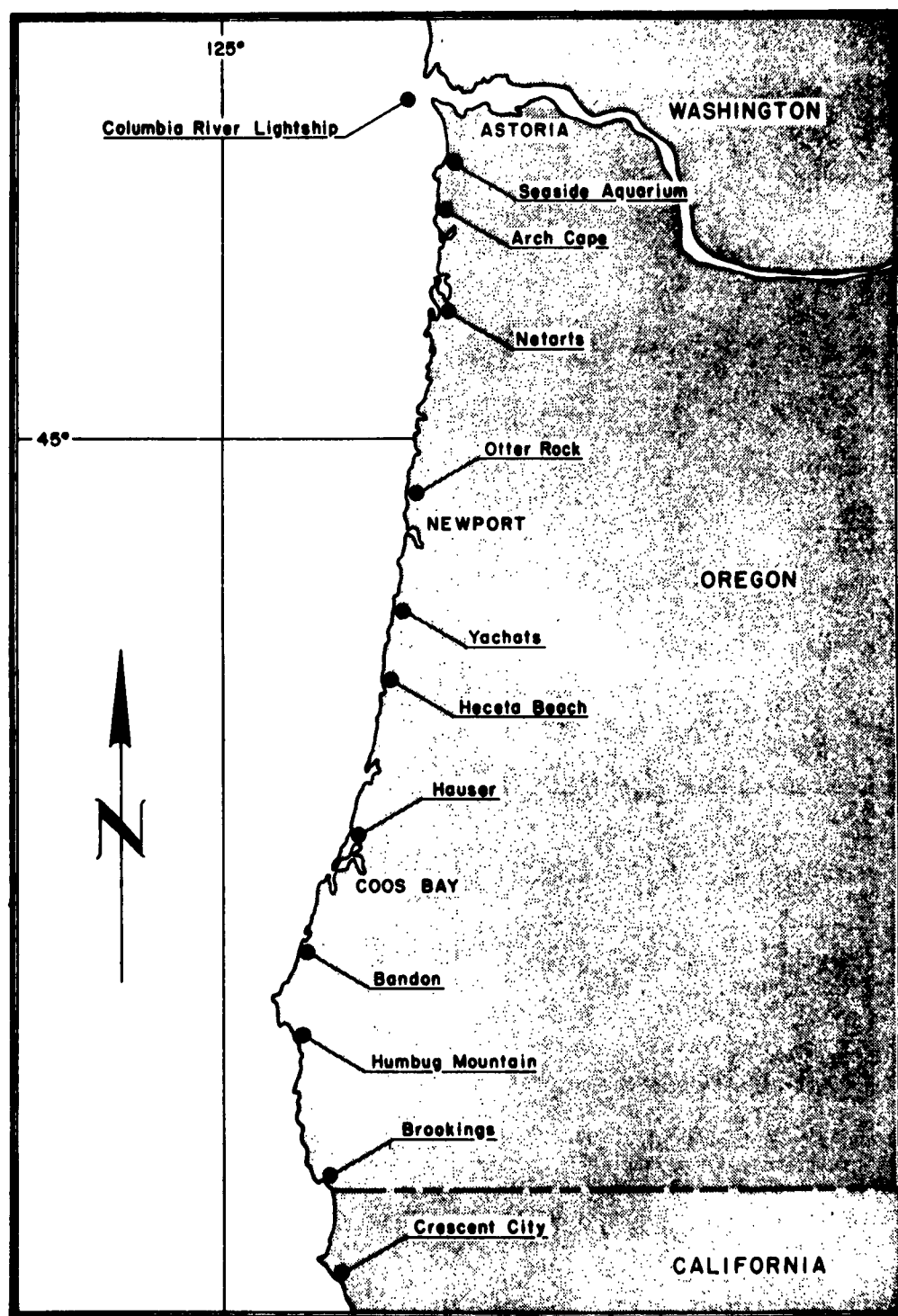


FIGURE 1. LOCATION OF SHORE STATIONS

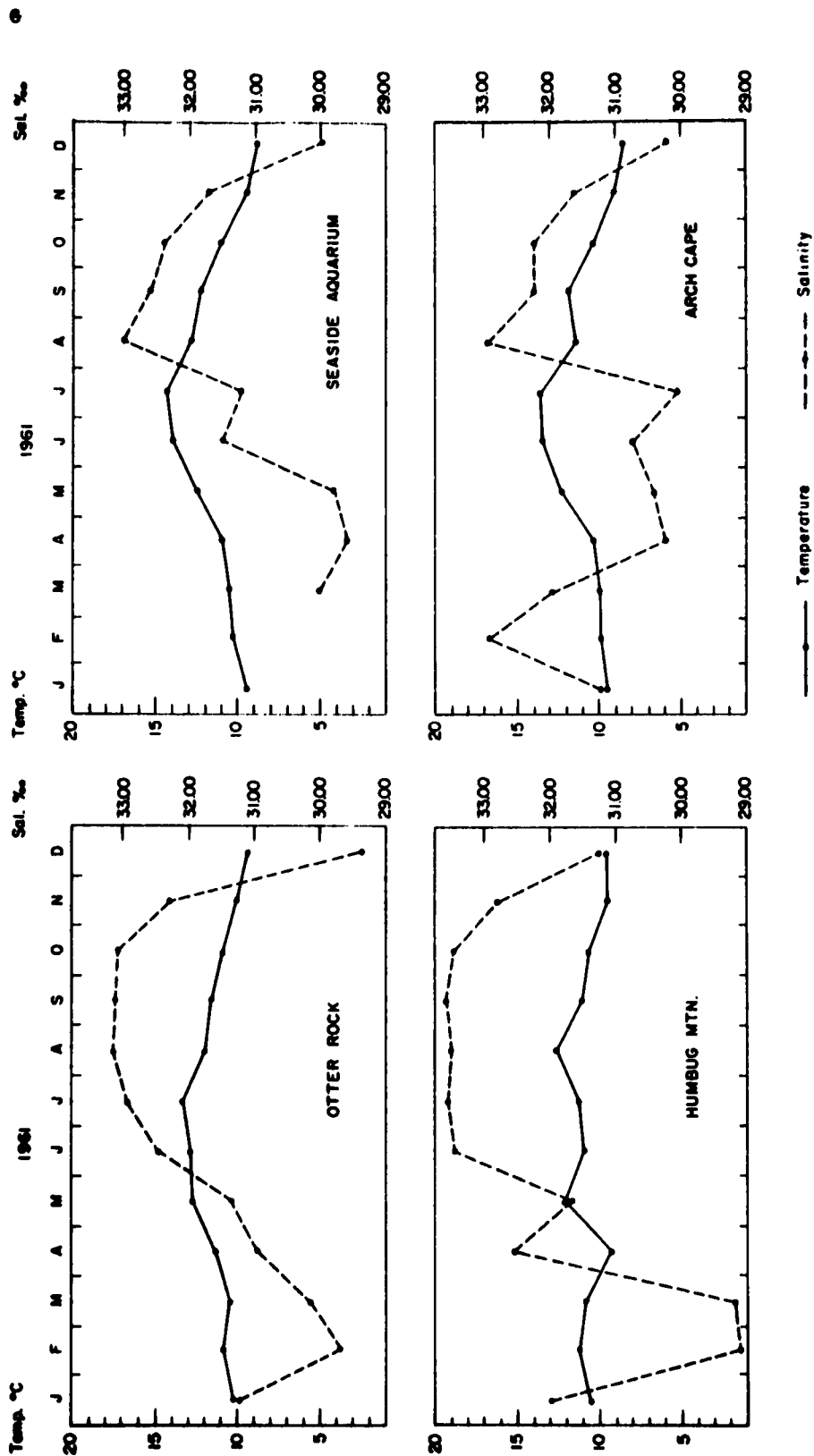


FIGURE 2. MEAN TEMPERATURE AND SALINITY

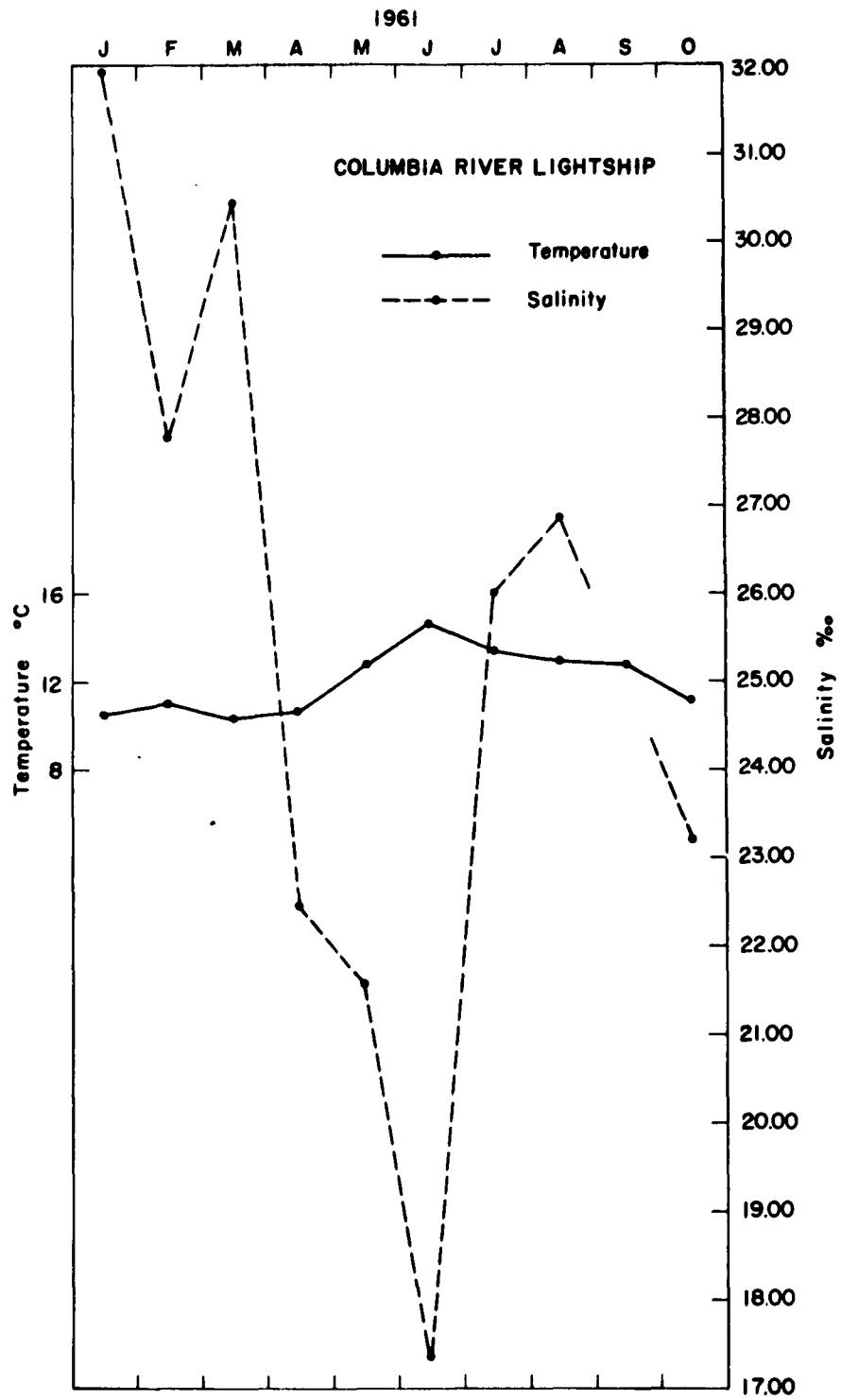


FIGURE 3. MEAN TEMPERATURE AND SALINITY

TABLE 11. TEMPERATURE AND SALINITY OBSERVATIONS

COLUMBIA RIVER LIGHTSHIP

Date 1961	T °C	S ‰	Time PST	Date 1961	T °C	S ‰	Time PST	Date 1961	T °C	S ‰	Time PST
Jan. 21	10.0	31.89	0637	May 6	11.9		0633	July 29	13.5	28.77	1039
28	11.0	32.00	1010	13	12.5	31.76	0902	Aug. 5	12.2	26.09	0630
Feb. 4	11.0	32.36	1103	20	12.8	20.21	1005	12	11.9	27.57	1122
11	11.0		0500	24	12.9	16.94	0624	19	13.8	26.89	0303
25	11.0	23.21		27	13.0	17.34	0750	26	14.2		1035
March 4	10.9	26.35	0140	June 1	16.2	12.05	1141	Sept. 2	14.2		0548
11	10.0	32.27	1145	3	14.0	10.61	1245	9	12.5		1125
18	9.9	31.18	1042	8	14.1	20.28	0653	16	12.7		0239
25	10.4	31.96	1630	10	14.2	15.43	0802	23	12.2		0931
April 1	11.0	25.44	0926	15	14.3	28.82	1110	30	12.1		0239
9	10.8	17.05	0900	17	14.5	16.94	1206	Oct. 7	11.1	23.21	0920
15	10.4	24.88	0954	July 22	13.2	23.21	0400	14	11.4		0035

SEASIDE AQUARIUM

Jan. 1	9.1		1100	Feb. 23	10.7		0700	Apr. 16	11.3	29.7	1200
2	8.5		1145	24	10.8		0700	17	11.3	28.4	1245
3	9.1		1200	25	9.9		0700	18	10.8	27.1	1400
4	8.2		1230	26	10.3		0830	19	10.8	27.8	1500
5	8.5		1300	27	10.2		0930	20	11.1	27.8	1555
6	9.1		1330	28	10.4		0930	21	10.9	27.3	1605
7	9.1		1400					22	10.5	27.6	1700
8	9.5		1430	March 1	10.5	26.87	1015	23	10.0	27.7	0630
9	9.5		1500	2	10.0		1130	24	10.2	28.0	0700
10	9.5		1600	3	10.2		1230	25	10.7	26.8	0730
11	9.5		1615	4	10.3		1300	26	10.8	29.1	0825
12	9.5		0700	5	10.2		1330	27	10.7	29.9	0905
13	9.5		0730	6	10.0		1330	28	11.8	29.9	0930
14	10.0		0800	7	10.6		1500	29	12.0	28.1	1000
15	10.0		0830	8	10.6		1520	30	11.9	29.0	1115
16	9.5		0930	9	10.2	29.87	0740				
17	9.5		1015	10	10.0		0715	May 1	11.9	29.5	1215
18	10.0		1100	11	9.8		0700	2	11.9	30.6	1235
19	10.0		1200	12	9.8		0710	3	11.6	30.3	1320
20	10.0		1300	13	10.3		0755	4	11.8	29.3	1430
21	10.0		1330	14	10.9		0845	5	12.4	28.6	1610
22	10.0		1430	15	10.7		0945	6	12.5	29.7	1705
23	10.0		1530	16	10.6		1030	7	11.8	30.2	0705
24	9.5		1630	17	10.6	30.30	1125	7	12.6	29.5	1725
25	9.1		1730	18	10.8		1300	8	12.1	30.1	0700
26	9.1		0715	19	11.1	30.4	1400	8	12.5	29.8	1800
27	9.1		0745	20	11.1	29.0	1340	9	12.1	30.4	0720
28	9.1		0830	21	11.0	31.4	1430	10	11.9	30.4	0730
29	9.5		0900	22	11.5	30.8	1525	11	11.7	31.0	0830
30	9.5		0945	23	11.4	30.2	1645	12	11.9	29.5	0930
31	9.5		1030	24	11.0	30.3	1835	13	12.4	29.1	1130
				25	10.9	30.4	0730	14	12.4	30.2	1205
Feb. 1	10.0		1100	26	10.7	30.2	0735	15	12.7	30.6	1305
2	10.0		1130	27	10.5	29.4	0800	16	12.9	30.8	1355
3	10.0		1200	28	10.6	28.9	0825	16	12.4	31.4	1440
4	10.0		1330	29	10.9	30.4	0940	18	13.2	31.8	1545
5	10.0		1415	30	11.4	30.7	1020	19	13.4	31.8	1620
6	10.0		1500	31	11.7	30.4	1130	20	13.0	30.3	1720
7	10.0		1530					21	12.7	29.3	0845
8	10.0		1615	April 1	11.8	30.6	1220	22	12.9	28.2	0700
9	10.0		1715	2	11.9	29.9	1240	23	12.4	26.0	0735
10	9.5		0630	3	11.5	28.4	1315	24	12.7	29.1	0900
11	10.0		0700	4	11.4	32.5	1430	25	13.1	29.4	0915
12	10.4		0800	5	11.6	32.7	1500	26	13.4	28.6	1025
13	10.5		0845	6	11.7	32.9	1610	27	13.6	28.2	1025
14	10.6		0915	7	11.5	32.9	1730	28	13.6	28.2	1110
15	10.6		1045	8	10.8	32.9	0455	29	13.6	30.3	1205
16	10.1		1120	9	10.2	31.6	0710	30	14.3	29.5	1330
17	10.2		1205	10	10.4	32.9	0815	31	13.8	31.2	1440
18	10.2		1305	11	10.7	32.0	0755				
19	10.7		1415	12	10.5	27.8	0830	June 1	14.3	32.1	1500
20	11.0		1445	13	10.2	27.7	0930	2	13.2	31.9	1505
21	11.1		1600	14	10.4	29.4	1055	3	13.4	31.8	1600
22	10.7		0705	15	11.3	28.5	1130	4	13.3	29.7	0700

SEASIDE AQUARIUM

Date 1961	T °C	S ‰	Time PST	Date 1961	T °C	S ‰	Time PST	Date 1961	T °C	S ‰	Time PST
June 5	14.1		0705	Aug. 10	12.4	31.5	1205	Oct. 16	12.1	32.8	1600
6	14.8		2010	11	12.4	34.1	1230	17	11.7	33.1	1650
7	14.4		0900	12	12.8	31.8	1300	18	10.2	32.9	0650
8	14.8		0915	13	12.4	33.5	1335	19	10.7	33.2	0700
9	14.8		0940	14	13.1	31.9	1500	20	10.2	32.7	0745
10	14.9		1040	15	13.9	31.6	1600	21	10.4	32.5	0825
11	14.7		1155	16	15.1	32.1	1640	22	10.2	32.1	0915
12	14.6	27.6	1245	17	16.0	32.4	1645	23	10.7	31.0	0950
13	15.8		1315	18	12.4	32.8	1700	24	10.6	31.8	1020
14	17.5		1430	19	12.5	33.7	1700	25	11.6	32.0	1145
15	13.7	30.1	1240	20	13.9	34.0	1800	26	10.9	30.8	1315
16	12.2	29.7	1345	21	12.8	33.5	1900	27	10.7	31.0	1305
17	13.6	34.1	1455	23	11.9	33.3	1015	28	11.2	32.7	1320
18	13.8	30.1	1545	24	12.4	33.2	1115				
19	16.0	29.3	1715	25	12.7	32.8	1130	Nov. 9	10.4	29.8	1045
20	12.8	31.0	1645	26	12.3	32.9	1205	10	10.6	32.0	1115
21	13.3	30.3	0600	27	13.7	32.9	1215	11	10.7	32.5	1225
22	11.4	33.1	0720	28	12.7	32.9	1400	12	10.8	32.5	1300
23	12.5	32.8	0815	29	12.6	32.9	1430	13	10.4	32.5	1335
24	12.2	32.8	0925	30	13.1	33.5	1510	14	10.1	32.4	1430
25	12.4	32.8	1000	31	12.9	32.8	1820	15	9.6	33.2	0645
26	12.4	33.1	1100					16	8.7	32.7	0630
27	13.6	33.3	1200	Sept. 1	13.4	31.9	0630	17	9.0	32.3	0640
28	13.8	32.8	1215	2	14.3	31.9	1800	18	9.0	30.2	0715
29	15.7		1445	3	14.5	31.6	1830	19	8.7	30.8	0730
30	16.4		1440	4	13.9	32.3	2100	20	8.6	30.6	0900
				5	12.5	32.7	0930	21	8.9	30.4	0930
July 1	16.4		1320	6	11.9	33.1	1030	22	9.4	30.3	1000
2	16.1		1440	7	11.8	33.1	1030	23	9.5	31.1	1100
3	14.6	29.9	1700	8	11.2	33.1	1100	24	8.5	31.9	1130
4	14.4	29.7	0450	9	10.6	33.7	1130	25	8.9	31.9	1130
5	14.4	29.9	0610	10	10.5	32.8	1115	26	8.6	31.9	1205
6	15.2		0640	11	11.1	33.3	1215	27	9.3	31.6	1330
7	16.3		0830	12	11.3	33.1	1230	28	9.7	32.1	1400
8	15.4	27.7	0930	13	11.9	33.3	1240	29	9.6	31.9	0625
9	13.5	31.5	1030	14	12.5	32.5	1315	30	9.6	32.0	0630
10	12.0	33.6	1110	15	13.7	32.1	1335				
11	12.5	33.1	1140	16	14.0	31.6	1430	Dec. 1	9.7	31.8	0630
12	12.1	33.3	1205	17	15.0	31.9	1530	2	9.6	31.8	0630
13	14.0	30.8	1230	18	14.5	32.7	1700	3	9.0	30.4	0700
14	15.2	29.7	1345	19	12.4	32.5	0630	4	9.6	31.4	0745
15	16.6	29.1	1445	20	13.0	32.1	0730	5	9.3	30.6	0805
16	16.6	29.1	1515	21	11.4	32.5	0810	6	8.9	30.4	0850
17	18.0	29.4	1630	22	11.7	32.7	0900	7	9.1	31.0	0950
18	15.5	30.2	0330	23	11.7	32.9	0945	8	8.8	31.1	1020
19	14.5	31.2	0415	24	11.3	32.5	1000	9	8.8	31.4	1115
20	14.5	31.2	0610	25	11.5	33.5	1110	10	8.6	31.1	1145
21	15.1	30.4	0640	26	11.4	33.3	1135	11	8.0	31.2	1210
22	13.3	32.7	1945	27	11.7	33.3	1155	12	8.0	31.2	1310
23	13.6	32.4	2030	28	12.7	31.6	1245	13	7.7	26.1	1505
24	14.0	32.1	2100	29	12.4	32.0	1400	14	8.1	26.7	1545
25	12.2	32.4	1115	30	11.9	32.0	1500	15	8.3	26.9	0630
26	11.0	32.9	1145					16	8.4	26.7	0630
27	12.6	32.8	1230	Oct. 1	11.9	31.8	0630	17	8.4	29.8	0700
28	14.1	32.4	1255	2	11.0	32.5	0630	18	8.6	29.7	0715
29	14.2	31.6	1400	3	11.1	32.5	0710	19	8.8	29.7	0800
30	14.5	31.9	1430	4	10.8	33.2	0715	20	9.4	30.7	0900
31	13.8	32.0	1530	5	10.3	33.3	0755	21	9.4	30.8	0940
				6	10.7	32.1	0830	22	9.4	31.0	0955
Aug. 1	14.1	31.9	1600	7	10.5	32.8	0900	23	9.3	30.2	1050
2	13.9	31.8	1615	8	10.3	33.5	1115	24	9.7	30.8	1145
3	13.5	33.5	1715	9	11.3	32.5	1020	25	9.0	29.7	1210
4	12.3	32.8	1800	10	11.4	32.0	1050	26	8.7	28.9	1305
5	13.3	32.8	1930	11	11.6	31.8	1145	27	8.9	29.1	1420
6	11.9	32.8	2045	12	11.3	32.1	1145	28	9.5	29.5	1440
7	11.5	33.6	2100	13	11.9	32.8	1220	29	9.3	29.4	0630
8	11.4	31.8	2140	14	12.5	32.5	1330	30	9.3	29.1	0620
9	11.8	33.6	1015	15	12.9	32.4	1430	31	9.2	30.6	0630

ARCH CAPE

Date 1961		T °C	S °/oo	Time PST	Date 1961		T °C	S °/oo	Time PST	Date 1961		T °C	S °/oo	Time PST
Jan.	1	9.5		1210	Mar	19	10.2		1355	June	3	11.8	32.05	1605
	2	8.8		0830		20	10.3		1615		4	14.8		1710
	3	9.0		1615		21	10.4		1615		5	14.6		1610
	4	8.3		1615		22	10.3		1620		6	14.4		0645
	5	9.1		1610		23	10.4		1700		7	14.9		0805
	6	9.5		1620		24	10.5		1800		8	14.8		1055
	7	9.1	30.99	1520		25	10.3	30.44	0825		9	14.1		0925
	8	9.2		1610		26	9.8		0855		10	14.9	24.58	1040
	9	9.6		1730		27	10.0		0600		11	15.0		1155
	10	9.7		0605		28	9.8		0605		12	14.8		1425
	11	9.8		0555		29	9.7		0555		13	15.2		1315
	12	9.6		0620		30	10.1		0555		17	13.0	33.28	1530
	13	9.6		0600		31	11.4		1615		21	12.4		1855
	14	10.2	29.23	0940	April	1	11.0	30.03	1250		22	11.9		1825
	15	10.3		1045		2	11.2		1105		23	11.2		1940
	16	9.8		0605		3	11.2		1635		24	10.0		0755
	17	9.6		0605		4	10.6		1620		25	10.9	33.01	0950
	18	9.4		0600		5	10.8		1615		26	10.7		1045
	19	10.1		1650		6	11.0		1620		27	11.5		1230
	20	10.0		1730		7	10.7		1730		28	13.7		1145
	21	10.1	31.53	1530		8	10.1	32.03	1840		29	15.9		1335
	22	10.00		1630		9	9.6		0750		30	16.5		1930
	23	10.0		1715		10	9.5		0635	July	1	16.5	23.44	1450
	24	9.6		0610		11	9.6		0625		2	15.1		1550
	25	9.2		0645		12	9.6		0600		3	13.8		1630
	26	9.0		0640		13	9.8		1910		4	17.2		1740
	27	9.2		0650		14	9.5		0650		5	15.4		0625
	28	9.3	32.95	0945		15	10.2		0840		6	15.7		0705
	29	9.5		1100		16	10.4	31.46	1235		7	16.2		0635
	30	9.7		0555		17	10.8		1620		8	14.3		1050
	31	9.5		0600		18	10.3		1615		9	10.6	32.47	1020
Feb.	1	10.0		1615		19	10.0		1710		10	9.9		1140
	2	10.2		1615		20	10.2		1620		11	11.8		1235
	3	10.0		1610		21	9.8		1720		12	12.0		1250
	4	10.3	33.03	1420		22	9.4	30.19	1825		13	15.1		1700
	5	10.7		1535		23	9.2		0600		14	15.6		1415
	6	10.3		1705		24	9.3		0550		15	17.4		1615
	7	10.0		1620		25	9.7		0610		16	16.5	28.86	1500
	8	10.3		0540		26	9.6		0515		17	18.0		1600
	9	10.3		0540		27	10.9		1815		18	16.5		1730
	10	10.2		0630		28	11.0		1750		19	13.6		1750
	11	10.3	33.17	0830		29	11.6	27.52	1145		20	12.9		1705
	12	9.3		0920		30	11.5		1220		21	11.2		0555
	13	9.2		0635	May	1	10.8		1620		22	10.0	32.59	0715
	14	9.3		0610		2	11.2		1620		23	10.3		0830
	15	9.0		0610		3	11.3		1630		24	10.8		0645
	16	9.6		0555		4	10.6		0605		25	11.5		2005
	17	10.1		1615		7	11.5	31.24	0630		26	9.5		1125
	18	9.7	33.17	1445		8	11.4		1655		27	11.8		1215
	19	10.2		1520		9	11.2		0620		28	11.9		1625
	20	9.8		1635		10	10.9		0600		29	11.9	32.95	1435
	21	9.8		1715		11	10.6		0645		30	13.0		1420
	22	10.2		1720		12	11.5		0645		31	14.0		1625
	23	10.2		0610		13	11.8	31.06	1135	Aug.	1	13.9		1615
	24	10.0		0550		14	12.7		1230		2	12.2		1740
	25	9.7	32.34	0825		15	13.8		1515		3	11.9		1740
	26	10.0		0920		16	13.5		1530		4	9.2		1845
	27	9.8		1655		17	12.8		1515		5	10.5	33.03	0800
	28	9.7		1625		18	11.7		1515		6	12.4		0900
March	1	10.0		1655		19	12.3		1525		7	10.0		0740
	2	10.1		1630		20	12.5	30.32	1645		8	8.5		0755
	3	9.6		1755		21	12.9		1755		9	9.5		1125
	5	8.5	32.30	1405		22	12.5		1655		10	10.4		1200
	6	9.6		1645		23	12.0		1700		11	10.7		1700
	7	9.6		1705		24	12.0		1700		12	11.2	33.17	1320
	8	9.4		1655		25	14.1		1740		13	12.0		1400
	9	9.3		1715		26	13.3		1855		14	10.9		1410
	10	9.3		1735		27	13.3	29.09	1035		15	11.3		1645
	11	8.5	33.19	0650		28	12.4		1120		16	13.8		1730
	12	9.0		0820		29	14.3		1415		17	13.6		1655
	13	9.5		0800		30	14.1		1240		18	11.7		1645
	16	10.1		1150		31	13.9		1435		19	10.7	33.17	1730
	17	10.4		1240	June	1	13.5		1630		20	9.5		0725
	18	10.7		1300		2	12.2		1530		21	9.2		0715

ARCH CAPE

Date 1961	T °C	S °/∞	Time PST
Aug. 22	8.4		0805
23	10.3		0815
24	12.2		1005
25	14.9		1415
26	13.8	32.34	1225
27	13.7		1315
28	12.2		1350
29	11.6		1445
30	11.1		1545
31	13.6		1615
Sept. 1	14.5		1635
2	12.3	32.30	0620
4	13.2		0720
5	13.6		0730
6	11.2		0900
7	11.6		1600
8	11.5		1530
9	9.5		1530

Date 1961	T °C	S °/∞	Time PST
Sept. 10	10.3	33.19	1215
11	10.9		1300
12	11.3		1335
13	10.0		1535
16	14.5	31.04	1535
17	12.9		1715
18	12.2		1830
21	10.0		0930
23	11.2	32.88	1100
27	11.5		1415
30	12.0	31.67	1530
Oct. 7	9.5	33.01	1100
14	12.4	32.12	1400
21	9.1	32.75	1000
28	10.3	31.02	0900
Nov. 5	9.3	31.47	1000
11	10.0	32.10	1230
18	8.5	31.55	1500
30	12.0	31.67	1530

Date 1961	T °C	S °/∞	Time PST
Nov. 25	8.0	31.38	1135
Dec. 2	9.2	30.84	1600
10	8.2	32.21	1300
17	7.8		1105
18	8.2		1305
19	8.5	29.69	1010
20	8.5		1625
21	8.3		1300
22	8.3		1330
23	8.6		1250
24	8.5	28.12	1315
25	8.0		1400
26	8.1		1515
27	8.1		1545
28	8.6		1620
29	8.8		1650
30	8.8		1815
31	8.5	30.12	0755

NETARTS

Date	T °C	S °/∞	Time PST
Jan. 7	10.2	30.95	1630
14	10.3	30.97	1130
24	8.0	30.95	0800
Feb. 5	11.1	30.01	1530
13	10.3	28.57	1130
20	10.2	29.42	1730
March 2	10.5	29.42	1300
7	9.2	24.38	1000
14	10.2	29.14	1130
20	10.7	29.16	1600

Date	T °C	S °/∞	Time PST
Mar. 28	10.6	31.58	1030
April 7	10.5	31.64	1030
26	11.0	29.07	1000
May 9	11.3	30.48	0830
10	14.8	30.32	1000
31	16.2	29.99	0930
June 16	15.0	32.29	1515
26	14.7	31.64	0700
Sept. 14	13.8	31.94	0930
28	12.3	32.47	1530

Date	T °C	S °/∞	Time PST
Oct. 5	12.8	31.96	1000
13	13.3	31.85	1500
21	12.0	31.92	1200
30	11.4	31.89	1700
Nov. 7	11.0	32.09	1200
12	10.7	32.05	1500
27	9.9	31.22	1600
Dec. 11	8.4	31.31	1500
22	8.8		1300

OTTER ROCK

Date	T °C	S °/∞	Time PST
Jan. 7	9.9	30.68	1500
14	10.9	30.93	1200
21	10.9	31.38	1500
28	9.3	31.82	0930
Feb. 4	11.1	30.16	1400
10	11.1	29.09	0715
18	10.7	29.58	1400
26	10.1	29.94	0930
March 4	10.3	31.02	1330
11	9.4	29.65	0700
18	11.5	30.16	1400
25	10.4	29.74	0700
April 1	12.4	31.13	1200
8	10.0		1830
15	12.0		1230
22	10.3	30.48	1800
29	11.9	31.18	1130

Date	T °C	S °/∞	Time PST
May 6	13.2	30.81	1700
13	12.4	30.88	1130
19	11.9	32.01	1630
28	13.4	31.65	1130
June 4	12.3	32.72	1800
11	14.1	31.40	1200
18	13.0	32.81	1600
24	11.6	32.92	0930
July 1	14.0	33.40	1500
9	13.8	33.13	1030
14	15.1	30.90	1400
22	10.2	33.71	0700
29	13.3	33.48	1330
Aug. 5	12.1	32.70	0900
12	11.4	32.90	1300
19	12.7	33.40	1730
26	11.5	33.51	1230

Date	T °C	S °/∞	Time PST
Sept. 1	12.2	33.21	1630
10	10.4		1230
17	12.5	32.70	1700
27	11.1	33.35	1200
Oct. 2	9.7	33.51	0800
8	10.1	33.60	1200
14	12.8	32.56	1530
21	10.2	33.06	1000
28	11.9	32.50	1400
Nov. 5	9.8	32.66	0930
12	11.7	32.00	1400
19	9.1	32.81	0930
27	9.2	31.62	1500
Dec. 2	9.1	30.57	0730
9	8.9	32.00	1300
17	8.7	30.93	1300
22	9.4	28.91	1130
31	10.4	24.27	1630

YACHATS

Date	T °C	S °/∞	Time PST
Jan. 8	10.3	30.39	1445
21	10.2	31.09	1440
29	10.7	30.86	1440
Feb. 5	11.3	28.83	1545
13	10.5		1615
19	10.4		1500
Mar. 14	9.8		1545
21	10.8	29.16	1745
28	11.4	31.04	1545
April 5	10.4	32.45	1815
12	10.1	32.05	1720

Date	T °C	S °/∞	Time PST
Apr. 20	10.2		1600
26	11.4	31.08	1550
May 2	11.7	28.08	1540
9	12.2	28.08	1730
17	10.9	31.89	1745
24	12.9	31.02	1730
31	13.4	31.47	1815
Aug. 12	10.1	33.60	1850
20	9.2	33.78	1245
27	12.0	33.42	1615
Sept. 3	12.4	33.30	1435

Date	T °C	S °/∞	Time PST
Sept. 9	10.1	33.55	1430
14	11.9		0930
Oct. 6	9.4	33.51	0945
14	12.8	32.38	1015
22	10.5		1600
29	10.6		0910
Nov. 5	10.5	31.73	1600
12	10.4	32.29	0930
18	9.4	32.50	1530
Dec. 8	8.9	31.29	1600
25	9.4	28.62	1630

NECATA BEACH

Date 1961	T °C	S ‰	Time PST	Date 1961	T °C	S ‰	Time PST	Date 1961	T °C	S ‰	Time PST
Feb. 4	11.4	23.34	1000	May 14	12.1	28.22	0800	June 20	12.1	31.92	1800
Apr. 23		30.59	0850	24	12.6	30.99	1005	July 2	8.9	33.42	0855
30	11.8	29.54	1745	June 5	12.6	31.76	1800	9	10.2	32.92	0940
May 8	12.0	28.42	1800	11	13.6	30.90	1445	23	8.8	33.44	0850

HAUSER

Jan. 1	7.8		1650	Mar. 18	8.6		1400	June 18	8.6	32.29	
7	7.7		1330	April 1	9.0		1400	25	7.9	33.03	1000
15	8.5		1800	9	9.3			July 2	8.1	33.48	1500
22	8.1		1500	15	7.7	30.86		9	8.7	32.83	1300
29	8.9		1200	22	8.8	31.38		16	11.7	32.56	1400
Feb. 5	9.3		1500	30	9.7			23	7.8	33.42	1000
12	8.1		1000	May 7	10.4	30.93		30	8.8	29.45	1800
19	8.7		1600	21	9.0	31.82		Aug. 6	7.3	33.10	2000
March 4	8.1		1400	June 4	8.8	32.45	1100	14	8.8	33.35	2000
11	8.3		1800	12	11.9	31.06	1100	20	8.7	33.46	1400

RANDON

Jan. 1	9.2		0925	Feb. 4	10.4	30.77	1630	July 25	11.4	33.44	0630
2	9.3		0830	12	10.9	22.00	1700	Aug. 6	12.2	33.42	0700
3	9.7		0905	18	12.4	29.63	1630	13	10.4	33.71	0900
4	9.9		1615	26	11.1	21.17	1600	20	10.4	27.68	0800
5	10.5		1600	March 5	9.7	30.17	1400	27	12.3	20.16	0647
6	10.6		1630	12		28.86	1630	Sept. 3	12.5	33.68	0700
7	10.5		1630	18		29.38	1630	10	12.3	33.78	0645
8	10.7	32.06	1100	26		28.80	1530	14	11.6	33.60	1430
9	10.8		1630	April 2		30.46	1600	21	10.6	33.62	0935
10	10.9		1745	9		32.56	1730	28	10.0	33.78	1425
11	10.9		1600	16	11.0	33.12	0730	Oct. 5	9.3	33.80	0915
12	10.6		1645	23	9.9	30.17	0810	12	12.3	32.61	0730
13	10.8		1630	30	12.1	30.84	1215	19	9.0	33.69	0815
14	11.2		1600	May 7	12.4	30.48	1615	26	10.2	32.72	1105
15	11.1	31.78	1700	14	13.8	28.64	1115	Nov. 2		33.33	0810
16	11.0		1630	21	12.1	32.16	0745	9	10.6	33.21	1150
17	11.0		1730	June 4	12.1	31.69	1745	16		33.19	0635
18	10.5		1730	11	12.1	32.45	0815	30	9.8	30.18	0635
19	10.7		1730	18	11.6	33.21	0845	Dec. 7	9.6	33.10	1105
20	10.8		1730	28	13.2	31.74	1815	14	8.7	31.89	1700
21	11.1		1730	July 4	10.6	33.53	1715	21	9.8	31.76	1100
22	10.9	32.09	1730	9	11.5	33.60	0900	28	10.5	28.39	1500
29	11.1	32.03	1600	17	11.4	33.42	0830				

HUMBURG MOUNTAIN

Jan. 4	9.9	32.94	1700	May 2	11.4	31.38	1100	Sept. 1	12.1	33.33	1835
11	10.0	31.80	1710	9	11.2	31.49	1025	10	9.5	33.82	1650
18	10.3	31.92	1720	17	11.7	32.74	1731	17	12.5		1630
25	11.0	31.85	1715	23	12.2	31.27	1800	24	9.8		1640
31	11.1	31.29	1720	30	13.7	31.46	1830				
Feb. 11	11.3	28.93	1730	June 10	11.7	32.84	1805	Oct. 1	9.6	33.82	1705
23	11.1	29.25	1755	18	11.2	33.55	1830	9	9.8	33.77	1335
March 2	10.4	29.61	1820	29	9.7	33.96	1120	16	12.7	32.90	1720
11	10.2	29.76	1705	July 8	10.8	33.66	1830	24	10.1	33.35	1700
18	10.7	28.64	1845	19	13.1	33.22	1900	Nov. 2	9.7	33.57	1515
21	11.1		1640	26	9.7	33.75	1620	9	9.8	33.35	1600
28	11.8	28.75	1800	Aug. 2	13.4	33.48	1835	19	8.7	33.55	1645
April 4	9.5	32.99	1740	9	10.0	33.75	1835	27	9.6	30.73	1000
11	8.0	33.08	1440	16	14.0	33.30	1825	Dec. 5	9.7	31.56	1530
18	7.8	33.55	1820	25	13.0	33.49	1425	12	9.1	32.84	1605
25	11.5	30.64	1800					21	9.8	29.31	1455

BROOKINGS

Date 1961		T °C	S °/oo	Time PST
Jan.	8	10.4	32.70	1530
	16	10.7	31.49	1630
	24	10.8	31.94	0930
	31	11.1	31.62	1000
Feb.	7	11.6	29.48	1530
	14	11.3	24.02	1400
	21	11.3	28.42	0830
	28	10.8	30.53	1030
March	9	10.9	31.15	0930
	15	10.6	29.99	1000
	21	11.6	24.36	1530
	28	11.9	29.52	1530

Date 1961		T °C	S °/oo	Time PST
April	5	10.4	33.13	1545
	15	10.0	31.82	1500
	23	9.8	31.00	1900
May	2	12.0	30.79	1530
	8	11.8	30.08	1330
	16	11.6	31.87	1300
	21	13.0	29.79	1230
	28	10.1	33.22	1500
June	15	12.4	32.30	1500
	19	15.2	31.00	1430
	28	13.2	32.74	1530

Date 1961		T °C	S °/oo	Time PST
July	15	14.0	33.17	1600
	23	14.6	33.24	1545
	29	13.6	32.81	1530
Aug.	7	15.6	33.01	1445
	16	14.2	33.30	1530
	25	14.5	33.30	1700
	31	14.0	33.12	1530
Sept.	18	11.5	33.19	0830
	26	12.2	33.46	1100
Oct.	2	11.9	33.66	1630
	9	10.5	33.87	1030
Dec.	22	9.8	29.74	1430

CRESCENT CITY

Date 1961		T °C	S °/oo	Time PST
Sept.	1	17.2	31.9	1400
	3	11.9	33.2	0920
	5	12.8	32.9	0705
	7	11.1	33.7	1210
	9	10.6	33.3	0850
	11	11.1	32.5	1230
	13	12.5	31.9	1200
	15	13.1	32.1	1400
	16	12.2	31.5	1435
	18	12.8	32.9	1455
	21	10.0	33.5	0810
	24	11.1	32.7	1010
	26	11.7	33.1	1605
	27	11.4	33.1	1225
	29	10.0	33.8	1425
	30	9.7	34.0	1300
Oct.	1	10.3	33.3	1340
	2	12.5	32.0	1300
	5	12.8	32.0	1535
	7	9.4	33.8	1225
	9	10.0	33.7	1245
	11	10.6	32.0	1100
	12	10.8	31.8	1425

Date 1961		T °C	S °/oo	Time PST
Oct.	14	11.7	32.8	0955
	15	12.5	32.7	1025
	17	12.8	33.2	1420
	19	12.5	32.8	1550
	22	10.8	32.5	0905
	24	10.8	33.3	0915
	26	11.1	32.0	0835
	27	11.4	31.0	1525
	28	11.4	32.4	1355
	30	10.8	33.6	1120
Nov.	1	10.8	32.9	1125
	2	11.1	32.1	1540
	4	11.9	31.0	1440
	5	10.8	32.1	1100
	6	11.1	31.4	1250
	8	10.8	33.1	1405
	10	11.1	31.9	1230
	11	11.1	32.4	1105
	14	10.8	32.8	0815
	15	10.3	34.1	1606
	18	9.4	33.2	1020
	19	9.4	33.2	1000
	20	9.2	33.8	1025

Date 1961		T °C	S °/oo	Time PST
Nov.	24	9.7	25.6	0910
	25	9.4	30.4	1530
	27	9.4	25.0	1330
	29	10.0	29.3	1445
	30	10.3	31.0	1650
Dec.	1	10.3	28.5	1255
	3	10.3	32.7	0930
	4	9.7	29.9	1015
	6	10.3	33.2	1200
	8	9.4	32.4	0940
	9	10.0	33.7	0940
	10	9.7	33.7	1130
	12	9.2	33.6	1015
	14	8.3	30.8	1505
	17	8.9	31.1	0845
	20	10.0	27.8	1215
	21	10.0	28.1	1155
	22	9.4	28.0	1450
	23	9.4	26.3	1310
	26	9.2	30.4	1210
	27	9.7	29.3	1310
	29	9.4	29.0	1255
	30	9.2	31.4	0915

TABLE III. MONTHLY MEAN TEMPERATURE AND SALINITY

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
<u>COLUMBIA RIVER LIGHTSHIP</u>													
TEMPERATURE °C													
Mean	10.5	11.0	10.3	10.7	12.6	14.6	13.4	13.0	12.7	11.2			12.0
Max.	11.0	11.0	10.9	11.0	13.0	16.2	13.5	14.2	14.2	11.5			
Min.	10.0	11.0	9.9	10.4	11.9	14.1	13.2	11.9	12.2	11.2			
Range	1.0	0.0	1.0	0.6	1.1	2.1	0.3	2.3	2.0	0.3			
No. of Obs.	2	3	4	3	5	6	2	4	5	2			
SALINITY ‰													
Mean	31.94	27.78	30.44	22.46	21.56	17.35	25.99	26.85		23.21			25.29
Max.	32.00	32.36	32.27	25.44	31.76	28.82	28.77	27.57		23.21			
Min.	31.89	23.21	26.35	17.05	16.94	10.61	23.21	26.09		23.21			
Range	0.11	9.15	5.92	8.39	4.82	18.21	5.56	1.48		0.00			
No. of Obs.	2	2	4	3	4	6	2	3		1			
<u>SEASIDE AQUARIUM</u>													
TEMPERATURE °C													
Mean	9.4	10.3	10.6	11.0	12.6	14.0	14.4	12.9	12.4	11.1	9.5	8.9	11.4
Max.	10.0	11.1	11.7	11.9	14.3	17.5	18.0	16.0	15.0	12.9	10.8	9.7	
Min.	8.2	9.5	9.8	10.0	11.7	11.4	11.0	11.4	10.5	10.2	8.5	7.7	
Range	1.8	1.6	1.9	1.9	2.6	6.1	7.0	4.6	4.5	2.7	2.3	2.0	
No. of Obs.	31	28	32	30	33	30	31	30	30	28	22	31	
SALINITY ‰													
Mean			30.0	29.6	29.8	31.5	31.2	33.0	32.6	32.4	31.7	30.0	31.2
Max.			31.4	32.9	31.8	34.1	33.6	34.1	33.5	33.5	33.2	31.8	
Min.			26.9	26.8	26.0	27.6	27.7	31.6	31.6	30.8	29.8	26.1	
Range			4.5	6.1	5.8	6.5	5.9	2.5	1.9	2.7	2.9	5.7	
No. of Obs.			16	30	33	19	27	30	30	28	22	31	
<u>ARCH CAPE, OREGON</u>													
TEMPERATURE °C													
Mean	9.5	9.9	9.9	10.3	12.3	13.4	13.5	11.4	11.8	10.3	9.0	8.4	10.8
Max.	10.3	10.3	11.4	11.6	14.3	16.5	18.0	14.9	14.5	12.4	10.0	9.2	
Min.	8.3	9.0	8.5	9.2	10.6	10.0	9.5	8.4	9.5	9.1	8.0	7.8	
Range	2.0	1.3	2.9	2.4	3.7	6.5	8.5	6.5	5.0	3.3	2.0	1.4	
No. of Obs.	31	28	28	30	29	24	31	31	19	4	4	17	
SALINITY ‰													
Mean	31.18	32.93	31.98	30.25	30.43	30.73	30.06	32.93	32.22	32.23	31.62	30.20	31.40
Max.	32.95	33.17	33.19	32.03	31.24	33.28	32.95	33.17	33.19	33.01	32.10	32.21	
Min.	29.23	32.34	30.44	27.52	29.09	24.58	23.44	32.34	31.04	31.02	31.38	28.12	
Range	3.72	0.83	2.75	4.51	2.15	8.70	9.51	0.83	2.15	1.99	0.72	4.09	
No. of Obs.	4	4	3	5	4	4	5	4	5	4	4	5	
<u>NETARTS, OREGON</u>													
TEMPERATURE °C													
Mean	9.5	10.5	10.2	10.8	14.1	14.8			13.0	12.4	10.5	8.6	11.4
Max.	10.3	11.1	10.7	11.0	16.2	15.0			13.8	13.3	11.0	8.8	
Min.	8.0	10.2	9.2	10.5	11.3	14.7			12.3	11.4	9.9	8.4	
Range	2.3	0.9	1.5	0.5	4.9	0.3			1.5	1.9	1.1	0.2	
No. of Obs.	3	3	5	2	3	2			2	4	3	2	
SALINITY ‰													
Mean	30.96	29.33	28.74	30.36	30.26	31.96			32.20	31.90	31.79	31.31	30.88
Max.	30.97	30.01	31.58	31.64	30.48	32.29			32.47	31.96	32.09	31.31	
Min.	30.95	28.57	24.38	29.07	29.99	31.64			31.94	31.85	31.22	31.31	
Range	0.02	1.44	7.20	2.57	0.49	0.65			0.53	0.11	0.87	0.00	
No. of Obs.	3	3	5	2	3	2			2	4	3	1	

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
<u>OTTER ROCK</u>													
TEMPERATURE °C													
Mean	10.2	10.8	10.4	11.3	12.7	12.8	13.3	11.9	11.6	10.9	10.0	9.3	11.3
Max.	10.9	11.1	11.5	12.4	13.4	14.1	15.1	12.7	12.5	12.8	11.7	10.4	
Min.	9.3	10.1	9.4	10.0	11.9	11.6	10.2	11.4	10.4	9.7	9.1	8.7	
Range	1.6	1.0	2.1	2.4	1.5	2.5	4.9	1.3	2.1	3.1	2.6	1.7	
No. of Obs.	4	4	4	5	4	4	5	4	4	5	4	5	
SALINITY ‰													
Mean	31.20	29.69	30.14	30.93	31.34	32.46	32.92	33.13	33.09	33.05	32.27	29.34	31.63
Max.	31.82	30.16	31.02	31.18	32.01	32.92	33.71	33.51	33.35	33.60	32.81	32.00	
Min.	30.68	29.09	29.74	30.48	30.81	31.40	30.90	32.70	32.70	32.50	31.62	24.27	
Range	1.14	1.07	1.28	0.70	1.20	1.52	2.81	0.81	0.65	1.10	1.19	7.73	
No. of Obs.	4	4	4	3	4	4	5	4	3	5	4	5	
<u>YACHTS</u>													
TEMPERATURE °C													
Mean	10.4	10.7	10.7	10.5	12.2			10.4	11.5	10.8	10.1	9.2	10.6
Max.	10.7	11.3	11.4	11.4	13.4			12.0	12.4	12.8	10.5	9.4	
Min.	10.2	10.4	9.8	10.1	10.9			9.2	10.1	9.4	9.4	8.9	
Range	0.5	0.9	1.6	1.3	2.5			2.8	2.3	3.4	1.1	0.5	
No. of Obs.	3	3	3	4	5			3	3	4	3	2	
SALINITY ‰													
Mean	30.78	29.83	30.10	31.86	30.11			33.60	33.42	32.94	32.17	29.95	31.48
Max.	31.09	29.83	31.04	32.45	31.89			33.78	33.55	33.51	32.50	31.29	
Min.	30.39	29.83	29.16	31.08	28.08			33.42	33.30	32.38	31.73	28.62	
Range	0.70	0.00	1.88	1.37	3.81			0.36	0.25	1.13	0.77	2.67	
No. of Obs.	3	1	2	3	5			3	2	2	3	2	
<u>HECATA BEACH</u>													
TEMPERATURE °C													
Mean		11.4		11.8	12.2	12.8	9.3						11.51
Max.		11.4		11.8	12.6	13.6	10.2						
Min.		11.4		11.8	12.0	12.1	8.8						
Range		0.0		0.0	0.6	1.5	1.4						
No. of Obs.		1		1	3	3	3						
SALINITY ‰													
Mean		25.34		30.06	29.21	31.53	33.26						29.88
Max.		25.34		30.59	30.99	31.92	33.44						
Min.		25.34		29.54	28.22	30.90	32.92						
Range		0.00		1.05	2.77	1.02	0.52						
No. of Obs.		1		2	3	3	3						
<u>HAUSER</u>													
TEMPERATURE °C													
Mean	8.2	8.7	8.3	8.9	9.7	9.3	9.0	8.3					8.8
Max.	8.9	9.3	8.6	9.7	10.4	11.9	11.7	8.9					
Min.	7.7	8.1	8.1	7.7	9.0	7.9	7.8	7.3					
Range	1.2	1.2	0.5	2.0	1.4	4.0	3.9	1.6					
No. of Obs.	5	3	3	5	2	4	5	3					
SALINITY ‰													
Mean				31.12	31.38	32.21	32.35	33.30					32.07
Max.				31.38	31.82	33.03	33.48	33.46					
Min.				30.86	30.93	31.06	29.45	33.10					
Range				0.52	0.89	1.97	3.03	0.36					
No. of Obs.				2	2	4	5	3					

	JAN.	FEB.	MARCH	APRIL	MAY	JUNE	JULY	AUG.	SEPT.	OCT.	NOV.	DEC.	MEAN
BANDON													
TEMPERATURE °C													
Mean	10.6	11.2	9.7	11.0	12.8	12.2	11.2	11.3	11.4	10.2	10.2	9.6	11.0
Max.	11.2	12.4	9.7	12.1	13.8	13.2	11.5	12.3	12.5	12.3	10.6	10.5	
Min.	9.2	10.4	9.7	9.9	12.1	11.6	10.6	10.4	10.0	9.0	9.8	8.7	
Range	2.0	2.0	0	2.2	1.7	1.6	0.9	1.9	2.5	3.3	0.8	1.8	
No. of Obs.	23	4	1	3	3	4	4	4	5	4	2	4	
SALINITY ‰													
Mean	31.99	25.89	29.30	31.43	30.41	32.27	33.50	28.74	33.69	33.20	32.48	31.28	31.18
Max.	32.09	30.77	30.17	33.12	32.16	33.21	33.60	33.71	33.78	33.80	33.33	33.10	
Min.	31.78	21.17	28.80	30.17	28.64	31.69	33.42	20.16	33.60	32.61	30.18	28.39	
Range	0.31	9.60	1.37	2.95	3.52	1.52	0.18	13.55	0.18	1.19	3.15	4.71	
No. of Obs.	4	4	4	5	3	4	4	4	5	4	4	4	
HUMBUG MOUNTAIN													
TEMPERATURE °C													
Mean	10.5	11.2	10.8	9.2	12.0	10.9	11.2	12.6	11.0	10.6	9.4	9.5	10.7
Max.	11.1	11.3	11.8	11.2	13.7	11.7	13.1	14.0	12.5	12.7	9.8	9.8	
Min.	9.9	11.1	10.2	7.8	11.2	9.7	9.7	10.0	9.5	9.6	8.6	9.1	
Range	1.2	0.2	1.6	3.4	2.5	2.0	3.4	4.0	3.0	3.1	1.2	0.7	
No. of Obs.	5	2	5	4	5	3	3	4	4	4	4	3	
SALINITY ‰													
Mean	31.96	29.09	29.19	32.56	31.67	33.45	33.54	33.50	33.58	33.46	32.80	31.24	32.17
Max.	32.94	29.25	29.76	33.55	32.74	33.96	33.75	33.75	33.82	33.82	33.57	32.84	
Min.	31.29	28.93	28.64	30.64	31.27	32.84	33.22	33.30	33.33	32.90	30.73	29.31	
Range	1.65	0.32	1.12	2.91	1.47	1.12	0.53	0.45	0.49	0.90	2.84	3.53	
No. of Obs.	5	2	4	4	5	3	3	4	2	4	4	3	
BROOKINGS													
TEMPERATURE °C													
Mean	10.8	11.2	11.2	10.1	11.7	13.6	14.1	14.6	11.8	11.2		9.8	11.8
Max.	11.1	11.6	11.9	10.4	13.0	15.2	14.6	15.6	12.2	11.9		9.8	
Min.	10.4	10.8	10.6	9.8	10.1	12.4	13.6	14.0	11.5	10.5		9.8	
Range	0.7	0.8	1.3	0.6	2.9	2.8	1.0	1.6	0.7	1.4		0	
No. of Obs.	4	4	4	3	5	3	3	4	2	2		1	
SALINITY ‰													
Mean	31.94	28.09	28.76	31.98	31.15	32.01	33.07	33.18	33.32	33.76		29.74	31.54
Max.	32.70	30.53	31.15	33.13	33.22	32.74	33.24	33.30	33.46	33.87		29.74	
Min.	31.49	24.02	24.36	31.00	29.79	31.00	32.81	33.01	33.19	33.66		29.74	
Range	1.21	6.51	6.79	2.13	3.43	1.74	0.43	0.29	0.27	0.21		0.00	
No. of Obs.	4	4	4	3	5	3	3	4	2	2		1	
CRESCENT CITY													
TEMPERATURE °C													
Mean									11.8	11.3	10.4	9.6	10.8
Max.									17.2	12.8	11.9	10.3	
Min.									9.7	9.4	9.2	8.3	
Range									7.5	3.4	2.7	2.0	
No. of Obs.									16	17	18	18	
SALINITY ‰													
Mean									32.9	32.6	31.4	30.6	31.9
Max.									34.0	33.8	33.8	33.7	
Min.									31.5	31.0	25.0	26.3	
Range									2.5	2.8	8.8	7.4	
No. of Obs.									16	17	18	18	

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Institute of Fisheries Research
Morehead City, N. C.

Director of Fisheries
Beach Road, Sea Point
Capetown, South Africa

Mr. D. W. Privett, Librarian
National Institute of Oceanography
Wormley, Nr. Godalming
Surrey, England

Dr. John Lyman
Associate Program Director for
Earth Sciences (Oceanography)
National Science Foundation
Washington 25, D. C.

Dr. Richard Bader
Earth Sciences
National Science Foundation
Washington 25, D. C.

Director
Pacific Oceanographic Group
Nanaimo, B. C.
Canada

Fisheries Research Board of
Canada
Atlantic Oceanographic Group
5 Terminal Road
Halifax, N. S., Canada

U. S. Navy Electronics Laboratory
Code 2252
San Diego 52, California

Fisheries-Oceanography Library
203 Fisheries Center
c/o Mrs. Helen D. Strickland,
Librarian
University of Washington
Seattle 5, Washington

Exchange Service of the Station de
Biologie Marine
Grande-Riviere, Caspe Sud
P. Q., Canada

Mrs. Winona Richey
Library, Research Laboratory
Route 1, Box 31-A
Clackamas, Oregon

Dr. E. M. Baldwin
Department of Geology
University of Oregon
Eugene, Oregon

State of California Water Pollution
Control Board
Fisheries Project Leader
Humboldt State College
Arcata, California

American Geological Institute
2101 Constitution Ave., N. W.
Washington 25, D. C.
Attn: Martin Russell

U. S. Department of Commerce
Coast and Geodetic Survey
Washington 25, D. C.
Attn: Geodetic Branch
Mr. Hyman Orlin

Mr. Ray Morgan
Oregon Fish Commission
859 Olney Avenue
Astoria, Oregon

Mr. Douglas Manske
2274 Wyda Way
Sacramento 25, California

Bureau of Sports Fisheries & Wildlife
U. S. Fish & Wildlife Service
Sandy Hook Marine Laboratory
P. O. Box 428
Highlands, New Jersey
Attn: Librarian

Air Force Office of Scientific
Research
Washington 25, D. C.

U. S. Geological Survey
Crustals Studies Branch
Denver, Colorado
Attn: Low Pikiser

U. S. Geological Survey
Menlo Park, California
Attn: Mr. Snaveley
Mr. Childs

U. S. Atomic Energy Commission
Richland, Washington
Attn: K. L. Englund, Chief
Radiation Sciences Branch

Environmental Sciences Branch
Division of Biology and Medicine,
E-201

U. S. Atomic Energy Commission
Washington 25, D. C.
Attn: Dr. I. E. Wallen

National Science Foundation
Environmental Biology Division
Washington 25, D. C.

National Science Foundation
Systematic Biology
Washington 25, D. C.

Senator Warren Magnuson
Attn: Mr. Daniel Markel
Senate Office Building
Washington 25, D. C.